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## Operative Report

Name of Patient: Dianna Berry

Date of Operation: 1-21-05

Surgeon: Dr. Owen Rogal

Area of Surgery: The mastoid process on the right, the unmyelinated sensory terminal nerve endings (sprouts) of the C2 and C3 nerves and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the cervical sympathetic plexus in the splenius capitus, longissimus capitus, superior oblique capitus, rectus capitus major and sternocleidomastoid muscles.

Total # of Procedures: 14

Total # of Lesions: 14

Fluoroscopic evaluation: 14 views

Length of Cannula: 5 cm

Anesthesia: Marcaine 0.5%, 8 cc

Medical History: Dianna reports that her worst pain is in her lower back, hip, jaw, ears, neck, and shoulder. The pain is described as constant and pulsating. The pain starts in her neck and radiates to her head. The pain occurs when she wakes up, sitting, reading, and while sleeping. Dianna gets headaches 2 times a week, they are in the back of her head on the right. Her jaw pain occurs also when she eats, yawn, swallow, and chew. She has pain in her neck when she raises her arms and lifts anything.

Dianna's lower back pain and hip pain hurt the most when she bends down or twist. When the pain starts in her back then radiating to her hip and leg. Dianna has had these areas of pain for 6 years.

Dianna was seen by Dr. Santelli, chiropractor and Dr. Heine, MD. She had a MRI done of her neck and shoulder, results are unknown.

Pre-operative interview: Dianna was interviewed and the procedure was explained. An update of the original chief complaints of the patient were: right

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neck pain 5 out of 10, right shoulder pain 3 out of 10, right lower back pain 3 out of 10, and headaches are occipital.

The most prominent area of tenderness that correlated with the existing chief complaints was determined during the palpation examination and selected. A fluoroscopic picture demonstrated that the tender area was the region of the mastoid process on the right. A prognostic block was performed under fluoroscopic guidance with a limited volume of anesthetic solution, 1 cc, to prevent the masking of any surrounding structures. The prognostic block performed at the mastoid process on the right decreased the pain from 5 out of 10 to 2 out of 10. Evaluation of the appropriate indications for surgery was completed by the comprehensive relief of associated pain patterns confirming the success of the prognostic block.

### Pre-operative Diagnosis:

- (1) Neuropathy of the unmyelinated sensory terminal nerve endings (sprouts) of the C2 and C3 nerves on the right, and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the cervical sympathetic plexus in the insertions of the splenius capitus, longissimus capitus, superior oblique capitus, rectus capitus major and sternocleidomastoid muscles at the mastoid process.

### Post-operative Diagnosis:

- (1) Neuropathy of the unmyelinated sensory terminal nerve endings (sprouts) of the C2 and C3 nerves on the right, and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the cervical sympathetic plexus in the insertions of the splenius capitus, longissimus capitus, superior oblique capitus, rectus capitus major and sternocleidomastoid muscles at the mastoid process.

Operation: Transection of the unmyelinated sensory terminal nerve endings of the C2 and C3 nerves on the right, and the bilateral sympathetic terminal nerve



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endings (sprouts) of the branches of the cervical sympathetic plexus in the insertions of the splenius capitus, longissimus capitus, superior oblique capitus, rectus capitus major and sternocleidomastoid muscles at the mastoid process on the right using a RFG-8 radiofrequency generator with a SMK-TC thermocouple electrode.

### Description of procedure:

The surgical area was prepped and draped in the normal fashion for this type of procedure.

1.0 cc of 5% marcaine solution was injected into the tissue with the point of the needle being held in contact with the bone and periosteum. An SMK-C (5) 5 cm insulated cannula with 4mm working end was then inserted into the tissue until it was in contact with the posterior border of the mastoid process at the site of the insertion of the longissimus capitus muscle on the right with the solid stylet in place. The solid stylet was removed from the SMK-C (5) insulated cannula and an SMK-TC (5) thermocouple electrode was inserted in its place. The position of the tip of the cannula and the electrode was evaluated under fluoroscopy to be the area of placement of the anesthetic injection which previously successfully completely eliminated the pain. The position of the tip was found to be in the desired place to perform the intended cautery. The RFG-8 radiofrequency generator was turned on and the mode selector knob was set on stim mode. The output lever switch was turned on. The frequency was set at 2 Hertz. The stimulation voltage knob was slowly advanced to 2 1/2 volts. Attention was directed to see if any motor nerves were being stimulated, which is manifested by twitching muscles in that area. Close observation revealed no reaction. The voltage stimulation knob was returned to zero. The output lever switch was turned off. The mode selector knob was turned to lesion. The output lever switch was again turned on. The RF power knob was slowly advanced until the temperature reached 80 degrees centigrade for 60 seconds. The RF power knob was returned to zero. The output lever switch was turned off. The mode selector switch was turned off.

The entire procedure was performed 14 times. Each time the SMK-TC thermocouple electrode and the SMK-C insulated cannula were withdrawn, reinserted and redirected into an unrelated tissue track to independently create another lesion. Reevaluation by fluoroscopy and stimulation to determine that

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the new location was appropriate and distinctly different from any prior lesion placement. The 14 lesions were arranged in the shape of an inverted "V". The first side of the inverted "V" was created by lesions which were made in a similar manner in a vertical arrangement from the most inferior aspect to the superior aspect of the mastoid process along the posterior mastoid border to include the muscle insertions of the sternocleidomastoid and splenius capitus muscle. The SMK-TC (5) thermocouple electrode was removed and the SMK-C (5) insulated cannula was removed.

The second side of the inverted "V" was created when the electrode and cannula were repositioned, in a medial direction to the mastoid process, to contact the osseous surface on the occipital bone at the osseous insertions of the superior oblique capitus and rectus capitus major. The additional lesions were made in a similar manner as before, in a vertical arrangement that converges superiorly with the superior extent of the lesions previously placed at the posterior border of the mastoid process. The final lesion placement outlined the external osseous border of the fissure medial to the mastoid process.

All lesions were performed with even distribution while in contact with the osseous surface for the purpose of pain reception ablation of the unmyelinated sensory terminal nerve endings (sprouts) of the C2 and C3 nerves and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the cervical sympathetic plexus in the insertions of the splenius capitus, longissimus capitus, superior oblique capitus, rectus capitus major and sternocleidomastoid muscles. A total of 14 procedures were performed at the mastoid process on the right.

An RFG 8 Radionics generator, with a continuous revolving clock face 60 second timer, was utilized. When the 80 degree C lesion temperature was achieved, the position of the second hand was noted, and the temperature was held for one complete minute. The starting times were recorded and documented in the patient's records. The rise of the thermotrol to an 80 degree temperature was achieved in a gradual manner, usually taking 5-10 seconds. Allowing for the different starting times due to the use of the continuous revolving clock face 60 second timer, the differences in time of each lesion production at various sites, pain elicitation, patient movement, operator observance and monitoring of treatment protocol, the starting times may vary



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### Operative Report

Name of Patient: Dianna Berry

Date of Operation: 1-28-04

Surgeon: Dr. Paul Palmerio

Area of Surgery: The anterolateral aspect of the 1<sup>st</sup> rib on the right, the unmyelinated sensory terminal nerve endings (sprouts) of the lower thoracic nerve, long thoracic and intercostal nerves and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the thoracic sympathetic ganglion in the insertions of the external oblique muscle, serratus anterior muscle and external intercostal muscles.

Total # of Procedures: 8

Total # of Lesions: 8

Length of Cannula: 5 cm

Fluoroscopic evaluation: 8 views

Anesthesia: Marcaine 0.5%, 3.5 cc

Medical History: Dianna reports that her worst pain is in her lower back, hip, jaw, ears, neck, and shoulder. The pain is described as constant and pulsating. The pain starts in her neck and radiates to her head. The pain occurs when she wakes up, sitting, reading, and while sleeping. Dianna gets headaches 2 times a week, they are in the back of her head on the right. Her jaw pain occurs also when she eats, yawn, swallow, and chew. She has pain in her neck when she raises her arms and lifts anything.

Dianna's lower back pain and hip pain hurt the most when she bends down or twist. When the pain starts in her back then radiating to her hip and leg. Dianna has had these areas of pain for 6 years.

Dianna was seen by Dr. Santelli, chiropractor and Dr. Heine, MD. She had a MRI do of her neck and shoulder, results are unknown.

*(Signature)*

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Pre-operative interview: Dianna was interviewed and the procedure was re-explained. An update of the original chief complaints of the patient were: right neck pain from 5 out of 10 to 2 out of 10, right trapezius pain 8 out of 10, and right shoulder pain from 8 out of 10 to 5 out of 10.

The most prominent area of tenderness that correlated with the existing chief complaints was determined during the palpation examination and selected. A fluoroscopic picture demonstrated that the tender area was the region of the anterolateral aspect of the 1<sup>st</sup> rib on the right. A prognostic block was performed under fluoroscopic guidance with a limited volume of anesthetic solution, 1 cc, to prevent the masking of any surrounding structures. The prognostic block performed at the 1<sup>st</sup> rib on the right decreased the right trapezius pain from 8 out of 10 to 3 out of 10, and neck pain from 5 out of 10 to 2 out of 10. Evaluation of the appropriate indications for surgery was completed by the comprehensive relief of associated pain patterns confirming the success of the prognostic block.

### Pre-operative Diagnosis:

- (1) Neuropathy of the unmyelinated sensory terminal nerve endings (sprouts) of the lower thoracic nerves, long thoracic nerves and the intercostal nerves of the thoracic on the right, and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the thoracic sympathetic ganglion in the external oblique muscle, serratus anterior muscle and the external intercostal muscles insertions at the 1<sup>st</sup> rib.

### Post-operative Diagnosis:

- (1) Neuropathy of the unmyelinated sensory terminal nerve endings (sprouts) of the lower thoracic nerves, long thoracic nerves and the intercostal nerves of the thoracic on the right, and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the thoracic sympathetic ganglion in the external oblique muscle, serratus anterior muscle and the external intercostal muscles insertions at the 1<sup>st</sup> rib.



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Operation: Transection of the unmyelinated sensory terminal nerve endings of the lower thoracic nerve, long thoracic nerve and intercostal nerves on the 1<sup>st</sup> rib on the right, and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the thoracic sympathetic ganglion in the insertions of the external oblique muscle, serratus anterior muscle and the external intercostal muscles at the 1<sup>st</sup> rib using a OWL radiofrequency generator with a SMK-TC thermocouple electrode.

### Description of procedure:

The surgical area was prepped and draped in the normal fashion for this type of procedure.

1.0 cc of 5% marcaine solution was injected into the tissue with the point of the needle being held in contact with the bone and periosteum. An SMK-C (5) 5 cm insulated cannula with 4mm working end was then inserted into the tissue until it was in contact with the bone, at the anteriolateral aspect of the 1<sup>st</sup> rib on the right with the solid stylet in place. The solid stylet was removed from the SMK-C (5) insulated cannula and an SMK-TC (5) thermocouple electrode was inserted in its place. The position of the tip of the cannula and the electrode was evaluated under fluoroscopy. The position of the tip was found to be in the desired place to perform the intended cautery. The Owl radiofrequency generator was turned on and the mode selector knob was set on stim mode. The output lever switch was turned on. The frequency was set at 2 Hertz. The stimulation voltage knob was slowly advanced to 2 1/2 volts. Attention was directed to see if any motor nerves were being stimulated, which is manifested by twitching muscles in that area. Close observation revealed no reaction. The voltage stimulation knob was returned to zero. The output lever switch was turned off. The mode selector knob was turned to lesion. The output lever switch was again turned on. The RF power knob was slowly advanced until the temperature reached 80 degrees centigrade for 60 seconds. The RF power knob was returned to zero. The output lever switch was turned off.

The entire procedure was performed 8 times. Each time the SMK-TC thermocouple electrode and the SMK-C insulated cannula were withdrawn, reinserted and redirected into an unrelated tissue track to independently create another lesion. Reevaluation by fluoroscopy and stimulation to determine that

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the new location was appropriate and distinctly different from any prior lesion placement. The 8 lesions were arranged in a linear alignment to create a horizontal row, medial and lateral to the guide needle, with even distribution while in contact with the osseous surface for the purpose of pain reception ablation of the unmyelinated sensory terminal nerve endings (sprouts) of the terminal branches of the lower thoracic nerve, long thoracic nerve, intercostal nerve and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the thoracic sympathetic ganglion in the external oblique muscle, serratus anterior muscle and external intercostal muscle on the 1<sup>st</sup> rib on the right. A total of 8 procedures were performed on the anterolateral aspect of the 1<sup>st</sup> rib.

An Owl generator, with an automatic timer was utilized. The timer was set to 70 seconds. The rise of the thermotrol to an 80 degree temperature was achieved in a gradual manner, usually taking 5-10 seconds. The temperature was held for one complete minute. The lesions numbers were recorded in numerical order and documented in the patients records. Respectively, the following reflects the record of the lesions performed on the patient as recorded by the surgeon in the operative notes. Because the Owl generator utilizes an automatic timer, each lesion has identical timing. To conform with the operative notes as written by the surgeon, who places a check next to each lesion number as it is performed, a similar list follows to reflect the operative notes.

- |      |      |
|------|------|
| 1. ✓ | 6. ✓ |
| 2. ✓ | 7. ✓ |
| 3. ✓ | 8. ✓ |
| 4. ✓ |      |
| 5. ✓ |      |

### Surgical Completion

Dianna was given an appropriate review of post-operative instructions, including administration of pain and antibiotic medication, application of cold pak, and additional directions regarding observance of any untoward reactions (fever, bleeding, excessive swelling) from surgery with advisement to call immediately. All muscles were functioning normally, special care was taken to



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evaluate the patient's breathing, and the patient was dismissed. Dianna has a scheduled future appointment with The Pain Center.

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8

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### Operative Report

Name of Patient: Dianna Berry

Date of Operation: 2-4-05

Surgeon: Dr. Paul Palmerio

Time Started: 7:30am

Time Completed: 8:30am

Area of Surgery: Transverse process of C5 on the right, to the unmyelinated sensory terminal nerve endings (sprouts) of the C5 nerve root and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the cervical sympathetic ganglion in the insertions of the longissimus capitus, semi-spinalis capitus, inter traverse posteriores cervicis and rotaries cervicis muscles

Total # of Procedures: 8

Total # of Lesions: 8

Fluoroscopic evaluation: 8 views


Length of Cannula: 5 cm

Anesthesia: Marcaine 0.5%, 3 cc

Accident History: Amy was involved in a motor vehicle accident on 10/17/03. She states: "I was stopped for the car in front of me to complete a left turn. The car behind me did not stop and hit me in the rear twice. I was the driver wearing a seatbelt which stopped my body. My head continued moving forward both times. The Lumbar support was broken and bruised my lower back."

First her body was thrown forward than backward and forward then backward again. She hit her head on the headrest. She felt her pain immediately. Amy then was taken to the hospital, she was prescribed percocets and told her to rest.

Amy works in the shoe department at Sears. Her job involves lifting, bending over, and talking on the phone. Since the accident, Amy was out of work for 3 months. She has continued working, but the pain increases when she does any activities. She no longer can lift, return stock to the stockroom, or bend.

  
len palmerio feb-05



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**Medical History:** Amy's pain is in her head, neck, shoulder, arm, ribs and back. The pain can be described constant and protracted. She also feels numbness in her arm. When the pain starts, it starts in her neck and radiates to her shoulders, upper back, and arms. Amy has pain through out the day and night. The pain increases when she raises her arms, bends forward, or lifts.

Since her accident, Amy has seen Dr. Jon McCullough, who gave her adjustments, physical therapy, and stimulation modalities. Dr. Craig Feinman and recommended RFS and monitored her medication. Sharon Czebotar who treated her with acupuncture and guasha. Dr. Ashok Thanki, who performed 3 facet injections. Dr. Bradley Fink, who referred her to Dr. Goldberg for additional epidurals. She also saw a Neurologist, Dr. Urbaniak. Amy had a MRI done on 10/24/03 of the cervical area herniation. MRI done 11/1/03 lumbar, results were normal. MRI done 9/25/04 for her brain, results were normal. Another cervical MRI was performed, results were herniated and torn discs. A EKG was done on 12/23/03 for her upper/lower extremities, results were upper pinched nerves and carpal tunnel.

**Pre-operative interview:** Dianna was interviewed and the procedure was re-explained. An update of the original chief complaints of the patient were: right neck pain from 2 out 10 to 4 out of 10, right trapezius pain from 8 out of 10 to 4 out of 10, and right shoulder pain from 5 out of 10 to 0 out of 10. Dianna reported that the prior radiofrequency procedure reduced her right 1<sup>st</sup> rib pain. She follows sleeping position.

The most prominent area of tenderness that correlated with the existing chief complaints was determined during the palpation examination and selected. A fluoroscopic picture demonstrated that the tender area was the region of the transverse process of C5 on the right. A prognostic block at the transverse process of C5 on the right was performed under fluoroscopic guidance with a limited volume of anesthetic solution, 1 cc, to prevent the masking of any surrounding structures. The prognostic block performed at the transverse process of C5 on the right decreased the right neck pain from a 4 out of 10 to a 0 out of 10. Evaluation of the appropriate indications for surgery was completed by the comprehensive relief of associated pain patterns confirming the success of the prognostic block.

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### Pre-operative Diagnosis:

- (1) Neuropathy of the unmyelinated sensory terminal nerve endings (sprouts) of the branches of the C5 nerve root on the right, C5 transverse process, and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the cervical sympathetic ganglion in the insertions of the longissimus capitus, semi-spinalis capitus, inter traverse posteriores cervicis and rotaries cervicis muscles

### Post-operative Diagnosis:

- (1) Neuropathy of the unmyelinated sensory terminal nerve endings (sprouts) of the branches of the C5 nerve root on the right, C5 transverse process, and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the cervical sympathetic ganglion in the insertions of the longissimus capitus, semi-spinalis capitus, inter traverse posteriores cervicis and rotaries cervicis muscles

**Operation:** Transection of the unmyelinated sensory terminal nerve endings (sprouts) of the branches of the C5 nerve root on the right C5 transverse process, and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the cervical sympathetic ganglion in the insertions of the longissimus capitus, semi-spinalis capitus, inter traverse posteriores cervicis and rotaries cervicis muscles using an OWL radiofrequency generator with an SMK-TC (5) thermocouple electrode.

### Description of Procedure:

The head was prepped and draped in the normal fashion for this type of procedure.

1.0 cc of 5% marcaine solution was injected into the tissue with the point of the needle being held in contact with the bone and periosteum. An SMK-C (5) 5 cm insulated cannula with 4mm working end was then inserted into the tissue



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until it was in contact with the bone at the site of the terminal end of the dorsal surface of the articular pillar of the transverse process of C5 on the right with the solid stylet in place. The solid stylet was removed from the SMK-C (5) insulated cannula and an SMK-TC (5) thermocouple electrode was inserted in its place. The position of the tip of the cannula and the electrode was evaluated under fluoroscopy. The position of the tip was found to be in the desired place to perform the intended cautery. The OWL radiofrequency generator was turned on and the mode selector knob was set on stim mode. The output lever switch was turned on. The frequency was set at 2 Hertz. The stimulation voltage knob was slowly advanced to 2 1/2 volts. Attention was directed to see if any motor nerves were being stimulated, which is manifested by twitching muscles in that area. Close observation revealed no reaction. The voltage stimulation knob was returned to zero. The output lever switch was turned off. The mode selector knob was turned to lesion. The output lever switch was again turned on. The RF power knob was slowly advanced until the temperature reached 80 degrees centigrade for 60 seconds. The RF power knob was returned to zero. The output lever switch was turned off. The mode selector switch was turned off.

The entire procedure was performed 8 times. Each time the SMK-TC (5) thermocouple electrode and the SMK-C (5) insulated cannula were withdrawn, reinserted and redirected into an unrelated tissue track to independently create another lesion. Reevaluation by fluoroscopy and stimulation to determine that the new location was appropriate and distinctly different from any prior lesion placement. The 8 lesions were arranged in two rows on the dorsal surface of the lamina in the region of the articular pillar of the transverse process, parallel to the junction of the dorsal and lateral surfaces of the lamina, with even distribution while in contact with the osseous surface for the purpose of pain reception ablation of the unmyelinated sensory terminal nerve endings (sprouts) of the C5 nerve root and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the cervical sympathetic ganglion in the insertions of the longissimus capitis, semi-spinalis capitis, inter traverse posteriores cervicis and rotaries cervicis muscles. A total of 8 procedures were performed on the right terminal aspect of the transverse process of the C5 vertebra.

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An Owl generator, with an automatic timer was utilized. The timer was set to 70 seconds. The rise of the thermotrol to an 80 degree temperature was achieved in a gradual manner, usually taking 5-10 seconds. The temperature was held for one complete minute. The lesion numbers were recorded in numerical order and documented in the patient's records. Respectively, the following reflects the record of the lesions performed on the patient as recorded by the surgeon in the operative notes. Because the Owl generator utilizes an automatic timer, each lesion has identical timing. To conform with the operative notes as written by the surgeon, who places a check next to each lesion number as it is performed, a similar list follows to reflect the operative notes.

- |      |      |
|------|------|
| 1. ✓ | 6. ✓ |
| 2. ✓ | 7. ✓ |
| 3. ✓ | 8. ✓ |
| 4. ✓ |      |
| 5. ✓ |      |

### Surgical Completion

Dianna was given an appropriate review of post-operative instructions, including administration of pain and antibiotic medication, application of cold pak, and additional directions regarding observance of any untoward reactions (fever, bleeding, excessive swelling) from surgery with advisement to call immediately. All muscles were functioning normally and the patient was dismissed. Dianna has a scheduled future appointment with The Pain Center.

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### Operative Report

Name of Patient: Dianna Berry

Date of Operation: 2-11-05

Surgeon: Dr. Stuart Kauffman

Area of Surgery: Transverse process of C6 on the right, to the unmyelinated sensory terminal nerve endings (sprouts) of the C6 nerve root and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the cervical sympathetic ganglion in the insertions of the longissimus capitis, semi-spinalis capitis, inter traverse posteriores cervicis and rotaries cervicis muscles.

Total # of Procedures: 9

Total # of Lesions: 9

Fluoroscopic evaluation: 9 views

Length of Cannula: 5 cm

Anesthesia: Marcaine 0.5%, 4 cc

Medical History: Dianna reports that her worst pain is in her lower back, hip, jaw, ears, neck, and shoulder. The pain is described as constant and pulsating. The pain starts in her neck and radiates to her head. The pain occurs when she wakes up, sitting, reading, and while sleeping. Dianna gets headaches 2 times a week, they are in the back of her head on the right. Her jaw pain occurs also when she eats, yawn, swallow, and chew. She has pain in her neck when she raises her arms and lifts anything.

Dianna's lower back pain and hip pain hurt the most when she bends down or twist. When the pain starts in her back then radiating to her hip and leg. Dianna has had these areas of pain for 6 years.

Dianna was seen by Dr. Santelli, chiropractor and Dr. Heine, MD. She had a MRI done of her neck and shoulder, results are unknown.

Pre-operative interview: Dianna was interviewed and the procedure was re-explained. An update of the original chief complaints of the patient were: right neck pain from 4 out of 10 (constant) to 3 out of 10 (intermittent), and right upper



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trapezius pain from 4 out of 10 (constant) to 3 out of 10 (intermittent). Dianna reported that the prior radiofrequency procedure reduced her right C5 articular pillar pain. She follows sleeping position.

The most prominent area of tenderness that correlated with the existing chief complaints was determined during the palpation examination and selected. A fluoroscopic picture demonstrated that the tender area was the region of the transverse process of C6 on the right. A prognostic block at the transverse process of C6 on the right was performed under fluoroscopic guidance with a limited volume of anesthetic solution, 1 cc, to prevent the masking of any surrounding structures. The prognostic block performed at the transverse process of C6 on the right decreased the right neck pain from 3 out of 10 to 0 out of 10, and right upper trapezius pain from a 3 out of 10 to a 0 out of 10. Evaluation of the appropriate indications for surgery was completed by the comprehensive relief of associated pain patterns confirming the success of the prognostic block.

### Pre-operative Diagnosis:

- (1) Neuropathy of the unmyelinated sensory terminal nerve endings (sprouts) of the branches of the C6 nerve root on the right, C6 transverse process, and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the cervical sympathetic ganglion in the insertions of the longissimus capitus, semi-spinalis capitus, inter traverse posteriores cervicis and rotaries cervicis muscles.

### Post-operative Diagnosis:

- (1) Neuropathy of the unmyelinated sensory terminal nerve endings (sprouts) of the branches of the C6 nerve root on the right, C6 transverse process, and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the cervical sympathetic ganglion in the insertions of the longissimus capitus, semi-spinalis capitus, inter traverse posteriores cervicis and rotaries cervicis muscles.



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Operation: Transection of the unmyelinated sensory terminal nerve endings (sprouts) of the branches of the C6 nerve root on the right C6 transverse process, and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the cervical sympathetic ganglion in the insertions of the longissimus capitus, semi-spinalis capitus, inter traverse posteriores cervicis and rotaries cervicis muscles using an OWL radiofrequency generator with an SMK-TC (5) thermocouple electrode.

### Description of Procedure:

The head was prepped and draped in the normal fashion for this type of procedure.

1.0 cc of 5% marcaine solution was injected into the tissue with the point of the needle being held in contact with the bone and periosteum. An SMK-C (5) 5 cm insulated cannula with 4mm working end was then inserted into the tissue until it was in contact with the bone at the site of the terminal end of the dorsal surface of the articular pillar of the transverse process of C6 on the right with the solid stylet in place. The solid stylet was removed from the SMK-C (5) insulated cannula and an SMK-TC (5) thermocouple electrode was inserted in its place. The position of the tip of the cannula and the electrode was evaluated under fluoroscopy. The position of the tip was found to be in the desired place to perform the intended cautery. The OWL radiofrequency generator was turned on and the mode selector knob was set on stim mode. The output lever switch was turned on. The frequency was set at 2 Hertz. The stimulation voltage knob was slowly advanced to 2 1/2 volts. Attention was directed to see if any motor nerves were being stimulated, which is manifested by twitching muscles in that area. Close observation revealed no reaction. The voltage stimulation knob was returned to zero. The output lever switch was turned off. The mode selector knob was turned to lesion. The output lever switch was again turned on. The RF power knob was slowly advanced until the temperature reached 80 degrees centigrade for 60 seconds. The RF power knob was returned to zero. The output lever switch was turned off. The mode selector switch was turned off.

The entire procedure was performed 9 times. Each time the SMK-TC (5) thermocouple electrode and the SMK-C (5) insulated cannula were withdrawn, reinserted and redirected into an unrelated tissue track to independently create

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another lesion. Reevaluation by fluoroscopy and stimulation to determine that the new location was appropriate and distinctly different from any prior lesion placement. The 9 lesions were arranged in two rows on the dorsal surface of the lamina in the region of the articular pillar of the transverse process, parallel to the junction of the dorsal and lateral surfaces of the lamina, with even distribution while in contact with the osseous surface for the purpose of pain reception ablation of the unmyelinated sensory terminal nerve endings (sprouts) of the C6 nerve root and the bilateral sympathetic terminal nerve endings (sprouts) of the branches of the cervical sympathetic ganglion in the insertions of the longissimus capitus, semi-spinalis capitus, inter traverse posteriores cervicis and rotaries cervicis muscles. A total of 9 procedures were performed on the right terminal aspect of the transverse process of the C6 vertebra.

An Owl generator, with an automatic timer was utilized. The timer was set to 70 seconds. The rise of the thermotrol to an 80 degree temperature was achieved in a gradual manner, usually taking 5-10 seconds. The temperature was held for one complete minute. The lesion numbers were recorded in numerical order and documented in the patient's records. Respectively, the following reflects the record of the lesions performed on the patient as recorded by the surgeon in the operative notes. Because the Owl generator utilizes an automatic timer, each lesion has identical timing. To conform with the operative notes as written by the surgeon, who places a check next to each lesion number as it is performed, a similar list follows to reflect the operative notes.

- |      |      |
|------|------|
| 1. ✓ | 6. ✓ |
| 2. ✓ | 7. ✓ |
| 3. ✓ | 8. ✓ |
| 4. ✓ | 9. ✓ |
| 5. ✓ |      |

### Surgical Completion

Dianna was given an appropriate review of post-operative instructions, including administration of pain and antibiotic medication, application of cold pak, and additional directions regarding observance of any untoward reactions (fever, bleeding, excessive swelling) from surgery with advisement to call immediately. All muscles were functioning normally and the patient was dismissed. Dianna has a scheduled future appointment with The Pain Center.



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